



*Innovation Access Solution*

# **HT HG-9108**

## **GSM&DCS Dual Band Signal Booster**

# **User Manual**

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*REVISION: C*

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# Chapter 1

## Introduction

### 1.1 Overview

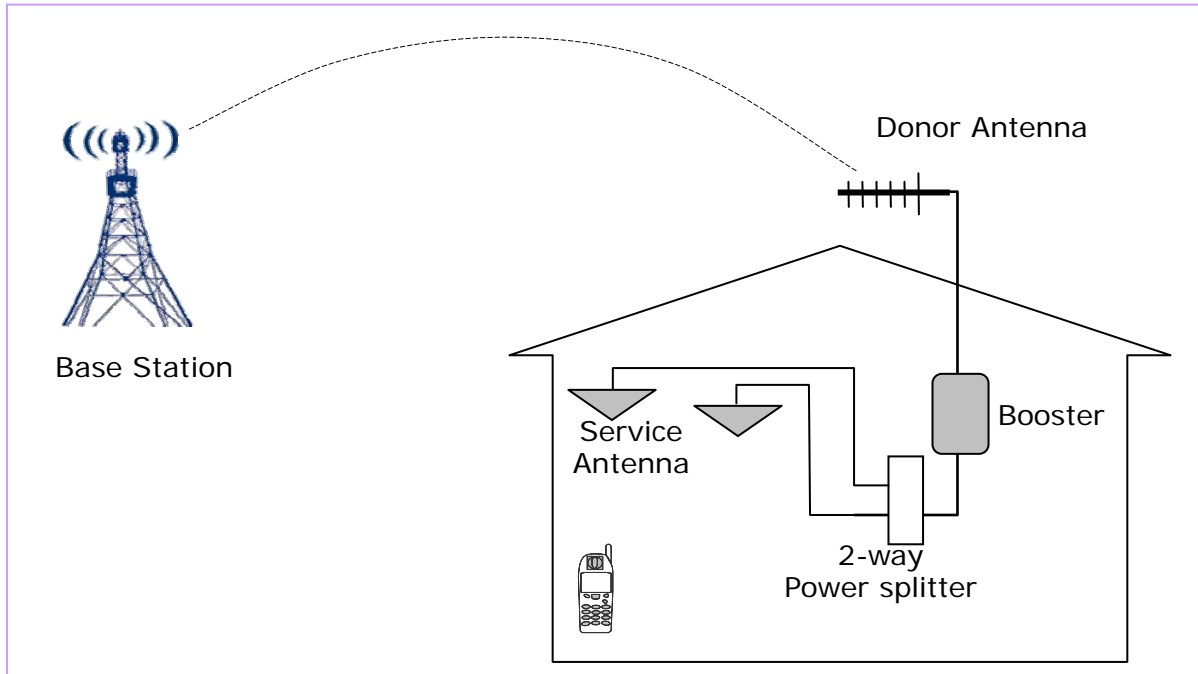
HG-9108 is HWATEL **GSM&DCS DUAL BAND signal booster** (also called indoor repeater) with high gain and low loss. It amplifies Multi-channel signals of GSM900 and DCS1800 cellular system. Greatly improves cell phone performance especially in building, eliminating problems such as unstable reception, unclear vocal quality, difficulty accessing calls and even calls being disconnected.

Suitable for applications of Interior signal enhancement: underground market, hotel, Garages, office, inside of the medium and small buildings, etc.

### 1.2 HWATEL booster family

MODEL	DESCRIPTION
HG-W900B	High gain high power Booster (Power=27dBm /Gain=75~80dB)
HG-9102A	Office Booster (Power=20dBm /Gain=60dB)
HG-9102B	Office Booster (Power=23dBm /Gain=70dB)
HG-9102C	Office Booster (Power=20dBm /Gain=50dB)
HG-9102A-X	Band Selective Booster (Power=20dBm /Gain=60dB)
HG-9102B-X	Band Selective Booster (Power=20dBm /Gain=70dB)
HG-9102C-X	Band Selective Booster (Power=20dBm /Gain=50dB)
<b><u>HG-9108B</u></b>	GSM DCS dual Band Selective Booster (Power=20dBm Gain=70dB@900M, 60Db@1800M)
HG-960	Low cost Home Booster (Power=20dBm /Gain=55dB)
HG-970	Low cost Home Booster (Power=20dBm /Gain=60dB)
HG-980	Low cost Home Booster (Power=23dBm /Gain=65dB)
HG-1800	GSM1800 repeater/Booster (Power=20 dBm, Gain =60 dB)

### 1.3 Typical application



## Chapter 2

### Technical Specification

#### 2.1 Feature

- High system gains.
- Full duplex and double-end design, external power supply, and convenient installation.
- ALC technology with auto-steady function adopted.
- Provide power indication and uplink and downlink indications.
- With the amplified linear power, the intermodulation and spuriousness are suppressed effectively.
- The reliability conforms to GB6993-86 standards.
- The electromagnetic compatibility conforms to ETS300

## 609-4 standards

## 2.2 Specification

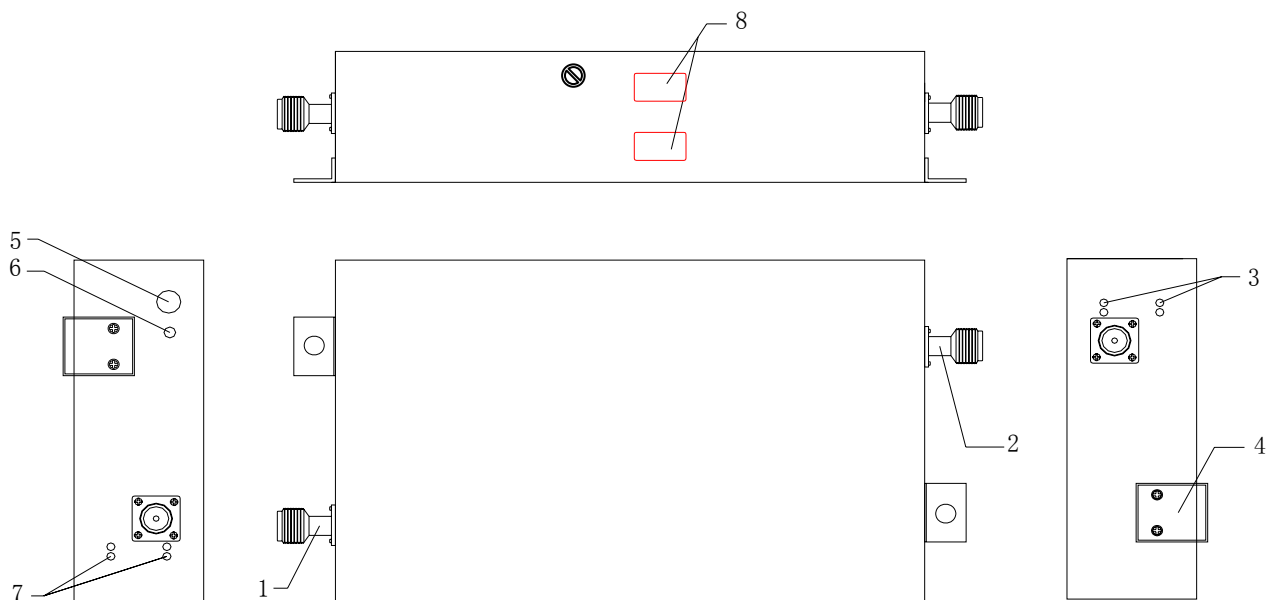
SPECIFICATION		TE9018A	TE-9018B	TE-9018C
Frequency range	Up link	GSM 890-915/DCS1710-1785(MHz)		
	Downlink	GSM 935-960/DCS1805-1880(MHz)		
Gain(dB)	GSM/DCS Up link	55//50	65/55	45/45
	GSM/DCS Downlink	60/55	70/60	50/50
Gain adjustable range		MGC $\geq$ 30dB		
Output power(dBm)		$\geq 17$	$\geq 20$	$\geq 17$
Pass band ripple	GSM	4dB		
	DCS	15dB		
Guard band rejection	GSM	(BW-60dB) $\leq$ 42 MHz (BW-70dB) $\leq$ 45 MHz		
	DCS	(BW-60dB) $\leq$ 104MHz (BW-70dB) $\leq$ 107 MHz		
I/O impedance		50 $\Omega$ /N Connector		
I/O return loss		$\leq -10$ dB		
Noise figure		$\leq -8$ dB		
Intermodulation attenuation (Po=13dBm)		$\geq 40$ dBc		
Transmission Delay		$\leq 0.5$ us		
Ambient temperature		$-10^{\circ}\text{C}\sim 50^{\circ}\text{C}$		
Power supply		AC110 $\sim$ 220V $\pm 10\%$ 45 $\sim$ 55Hz		
Size		158mm*136mm*37mm		
Reliability		To zhe GB6993-86 standard		
Electromagnetic compatibility		To zhe ETS300 694-4 standard		

Function	Power supply LED denote Export power ELD denote
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## Chapter 3

### Operation and Maintenance

#### 3.1 Equipment Outlook



#### 3.2 Connector and LED

(1) RF Port-BTS Port connected with service antenna facing to the base station.

(2) RF Port-User's Port connected with Donor / indoor covering system

(3) Downlink power indicator light

(4) Wall mount Bracket

(5) Power Supply connector

(6) Power indicator light

(7) Uplink power indicator light

(8) Adjustable gain

Attenuation (dB)

	1	2	3	4	5
Uplink	1	2	4	8	16
Downlink	1	2	4	8	16

## Chapter 4

### Installation

#### 4.1 Outdoor installation

(1) Use the GSM Mobile phone with test feature or GSM signal detect instrument test the GSM signal power on the top of the building or outdoor, select the highest power signal site. The outdoor antenna should be installed on this point.

(2) Insert connector of feeder into jack of antenna (Yagi ,log or panel antenna is suitable, The main lobe of the antenna radiation should be adjusted towards the base station antenna , more base station antenna should be visible as possible.), make sure they connect well.

(3) Customer can select suitable outdoor antenna according to real field test result. Normally, Yagi antenna is suitable for donor antenna.

(4) Caution: if possible use arrester to avoid possibly damage by the lightning.

#### 4.2 Indoor installation

- (1) Connect another end of outdoor antenna feeder to the RF BTS connector of booster.
- (2) Use another indoor feeder between " User's Port " and Indoor antenna. In general, the indoor covering system is composed of several splitters, couplers, expansion amplifiers and antennas and applied as per specific engineering design for the purpose of satisfying the signal covering demands in large area or complicated terrain indoor space. In the case of small area indoor space, the requirements for covering can be satisfied by using single relay antenna with the option of hanging antenna or ceiling antenna.

### 4.3 Power system

Finally, connect booster to 5V&2A AC/DC power adapter. The signal amplifier installation is completed.

### 4.4 Debugging and commissioning

- (1) Power on with 220V AC at the premise of no fault being found in inspection. The glowing indicator light shown as ⑤ in the above diagram is means the power supply works normally.
- (2) If the reverse antenna is mounted correctly, the Downlink power indicator light should be on. In this case, the covering area of the equipment shall be larger than that in the technical specifications.
- (3) If the required covering area is too large and the Downlink power indicator light is off after powering on, it means that the input power is not sufficient and the position of the reverse antenna should be adjusted to receive more strong downlink signals.



(4) When the debug is completed, select more than 20 points in the covering area to test the signal level and talking effect of the mobile phone. It should be ensured that the signal bar shall be fully filled with strong signal in 90% of the covering area, and less than 5% of the covering area can have two signal bars. Meanwhile talking clearly and no interruption occurs.

(5) Switch off and then power on, check whether it is normal. Then test with mobile phone, the working state shall remain same as the original. Keep it running for one to two hours around for further test.

(6) Recheck the whole system and clean up the working site.

(7) Record the work and fill in the Engineering Records Form in details and make the archives as well.

(8) Notice:

- The signal amplifier must be put into operation as per the above mentioned steps strictly.
- Ensure safety of the equipment and personnel. Be sure that there is no connection fault before powering on.
- Well Record the process and any fault shall be reported.
- 

## **4.5 5.4 System maintenance**

The strict power supply protection and power protection measures in the design of the signal amplifier assure high reliability of the equipment. When it is put into operation, rarely is manual maintenance required. But for assuring the high reliability of the communication in the covered area, it is recommended to check them half a year regularly, which shall include:

- (1) Check the reverse antenna system: find out if the antenna orientation or position is changed, or if the bolt is unfastened or loosened.
- (2) Check the indoor covering system: find out if the lines are removed or if the fixed devices are loose and if power is well connected. Remove the potential hazards as early as possible, if any.
- (3) Check transmitting power: find out if the panel indicator lights of the signal amplifier are working normally. The power indicator light should be on and the Uplink and Downlink power indicator lights should be on as well.
- (4) Timely remove the malfunction if any. Record the maintaining process and fill in related forms.

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## ***APPENDIX: Packing list***

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Following are in the Package:

Equipment -----	1
AC/DC Power Adaptor -----	1
User manual-----	1

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